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# METHOD AND DEVICE FOR APPLYING MARKING LINES TO A MINERAL-FIBER WEB CONTAINING A BINDING AGENT

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# METHOD AND DEVICE FOR APPLYING MARKING LINES TO A MINERAL-FIBER WEB CONTAINING A BINDING AGENT

[Verfahren und Vorrichtung zum Aufbringen von Markierungslinien auf eine bindemittelhaltige Mineralfaserbahn]


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## Claims /1*

1. Method for applying marking lines to a mineral-fiber web containing a binding agent, for which the surface of the mineral-fiber web lying on a continuous transport belt, particularly a

* The number in the margin indicates the pagination of the foreign text.

production belt, is exposed to the local heating effect of a stationary heating device, characterized in that the heating device is a roller, whose circumferential surface is laid on the surface of the mineral-fiber web, and which is turned at a speed that produces a circumferential speed of the roller at least approximately corresponding to the transport speed of the mineral-fiber web, and local, sharply limited, axis-parallel linear heating zones on the circumferential surface of the roller are heated to a temperature above the decomposition temperature of the binding agent in the mineral-fiber web.

2. Method according to Claim 1, characterized in that the roller is pressed into the surface of the mineral-fiber web to form a depression.

3. Method according to Claim 2, characterized in that the roller is laid on the mineral-fiber web under its own weight.

4. Method according to Claim 2 or 3, characterized in that the roller is driven by the surface of the mineral-fiber web.

5. Method according to one of Claims 1-4, characterized in that a plurality of heating zones aligned with one another and spaced at intervals from one another is used for forming a broken marking line.

6. Device for performing the method according to at least one of Claims 1-5, characterized by a shaft (2) of a roller (1) supported on a support frame (3) that can be raised and lowered, by heating rods (26) arranged axis-parallel on the circumference of the roller (1), and by a heating device (32) for the heating rods (26).

7. Device according to Claim 6, characterized in that the heating rods (26) are arranged in holders (25) made of heat-absorbing material, such as fibrous pressed composite, which

completely surround the heating rods (26) preferably on their sides arranged within the circumferential surface (29) of the roller (1).

8. Device according to Claim 6 or 7, characterized in that the heating rods (26) project out from the circumferential surface (29) of the roller (1) by a few millimeters.

9. Device according to one of Claims 6-8, characterized in that the heating rods (26) can be heated by embedded electrical tubular heating elements (32).

10. Device according to one of Claims 6-9, characterized in that the roller (1) has an inner carrier body (23) in the shape of a cylindrical polygon with the number of surfaces corresponding to the number of heating rods (26) around the circumference.

11. Device according to one of Claims 6-10, characterized in that the roller (1) can be driven by an electric motor (7) with a free-wheeling hub (44).

12. Device according to one of Claims 6-11, characterized in that the support frame (3) of the roller (1) is held in vertical position by means of an adjustment element (18) that can be adjusted in position by gears.

13. Device according to Claim 12, characterized in that the adjustment element (18) has at least one threaded spindle (20), which engages a holder frame (12) that can be raised or lowered for the support frame (3).

14. Device according to Claim 13, characterized in that the holder frame (12) is connected through a pressure medium drive (14) to the support frame (3) and the latter can be moved by means of the pressure medium drive (14) between an operating position and a standby position.

The invention concerns a method for applying marking lines on a mineral-fiber web containing a binding agent according to the preamble of Claim 1.

Such a method is known from DE-OS 32 29 601. The marking lines to be applied in this document run in the longitudinal direction of the mineral-fiber web, thus in its transport or production direction. For avoiding dye application with relatively expensive application technology, material consumption, and possible effects on combustion properties, a burned-in marking is generated in such a way that a tightly focused flame or a tightly focused stream of hot air with a temperature of, e.g., 600°C is directed onto the surface of the mineral-fiber web, which, in the center region of the flame, heats the binding agent at the surface of the mineral-fiber web to its decomposition temperature and thus changes the color of the web. In this way, generating an edge-parallel marking line in the longitudinal direction of the web only requires the arrangement of a corresponding hot-air nozzle or flame lance over the continuous mineral-fiber web.

However, such a procedure is limited to the application of edge-parallel marking lines; for generating marking lines that are perpendicular to the lateral edges, the hot-air nozzles or the like can no longer be stationary, but instead they must travel perpendicular over the mineral-fiber web and thus they must move together with the mineral-fiber web, which, however, would require considerable expense in terms of installation and especially control to achieve definitive and uniform marking intervals. Furthermore, such a flame or hot-air stream not only generates decomposition of the binding agent limited to the direct surface region, but it also inevitably exhibits a significant depth effect. Thus, at the marking line, there results a zone that penetrates to a greater or lesser extent into the mineral-fiber web, and no binding agent is effective in this zone. This is not harmful in the known case, because this zone runs in the longitudinal direction

of the web and thus is not exposed to forces acting perpendicular to the direction of the marking line. Because such mineral-fiber webs are usually rolled into a roll and stored and transported in roll form, forces appear on zones without any binding agent perpendicular to the longitudinal extent of the mineral-fiber web: if the marking side is on the outside in the roll, then the material tends to form gaps at the marking line; if it is on the inside, the material tends to become /2
compressed. Here, the product can become weakened due to partial decomposition of the fiber composite in the region of the marking line for tensile forces or due to increased crimping effects in the region of the marking line for compressive forces. Such a weakening is then particularly undesired if the material is to have homogenous, panel-like consistency after opening of the roll, like for the case of the parallel German Utility Model Application 86 10 424.1.

From DE-OS 34 46 406 it is known to use a roller as a heating device. However, this heating device in the form of a roller is not used to apply marking lines, but instead to generate fixing points penetrating deep into the material of the mineral-fiber web such that the mineral fibers are softened locally and thus fused together. For this purpose, the circumferential surface of the roller has a series of openings, through which hot gas is output at a high temperature typically up to 1000°C in the shape of a lance. The circumferential surface of the roller lies on the surface of the mineral-fiber web, and the roller rotates at a speed corresponding to the transport speed of the mineral-fiber web. Hot-gas output through a series of holes is then permitted only in the region of the bottom apex of the roller, so that the hot gas passes into the mineral-fiber web in the shape of a lance from each opening and forms fixing points. The penetration depth can be further controlled by the negative pressure generated at the opposite side of the mineral-fiber web.

Such a device is not used for applying marking lines, and it is also not suitable for generating marking lines, which practically have no effect on the behavior of the mineral-fiber material at the marking points. The large penetration depth desired in the known case can be reduced by throttling the hot-gas supply, but in every case it is significant because a local hot-gas stream must apply enough energy during the contact time to produce a deep color discoloration. In addition, the lateral limit of the effective region of the hot gas is difficult to create, particularly while the roller rotates, and thus it changes direction. For a hot-gas stream with minimized gas throughput for reducing the penetration depth, lateral stream portions come into play, which in the edge region of the marking still generate partial decomposition of the binding agent and thus lead to an unsharp border of the marking.

Starting from the state of the art according to DE-OS 32 29 601, the invention is based on the problem of creating a method and a device which enable the application of marking lines perpendicular to the side edges on a surface of a mineral-fiber web in the simplest and most reliable way possible and enable an application of cleanly defined marking lines in exact and uniform intervals with lesser penetration depth of the decomposition effects.

The solution of this task is done in terms of a method by the characterizing features of Claim 1 and in terms of a device by the characterizing features of Claim 6.

In this way, initially the concept of using a roller according to DE-OS 34 46 406 is referred to, where the roller lies on the mineral-fiber web. However, instead of using hot gas for the local decomposition of the binding agent, the surface of the roller is heated locally. Such a sharply defined, axis-parallel linear heating zone of correspondingly increased temperature produces a heating effect on the mineral-fiber web predominantly through conduction with a correspondingly steep temperature drop in the heat-absorbing mineral-fiber material, so that the

zone of decomposition remains limited to a flat surface region. In addition, the heating effect drops greatly to the sides, and at the same time a cooling effect can be exerted by adjacent, unheated zones at the circumferential surface of the roller, so that a sharply defined contour is produced. Due to the designed circumferential intervals of the heating zones on the circumferential surface of the roller, uniform intervals for the marking lines are always produced. However, according to the engagement relationships between the roller and the surface of the mineral-fiber web, a corresponding interval of marking lines on the mineral-fiber web can be produced, which deviates minimally from the circumferential interval of the heating zones at the surface of the roller; such a deviation between adjacent marking lines is barely measurable, however, over a plurality of marking lines, they can add up to a size that can be significant if, for example, 20 times the nominal distance of the marking lines is to be determined by counting 20 marking lines: here, instead of the theoretical value of 20x100 mm = 2 m, a different value of, e.g., 1.96 m can result. In order to exclude such minimal, but additive deviations, the roller can be rotated at a circumferential speed that deviates minimally from the transport speed of the mineral-fiber web in order to compensate for such small inaccuracies through the set relationships between the roller and the mineral-fiber web.

Because the energy drain away from the heated zones is limited to the degree that is required for a locally cleanly defined decomposition of the binding agent in just a flat surface layer, the energy consumption is minimized.

In an especially preferred configuration of the invention, the roller is pressed into the surface of the mineral-fiber web according to Claim 2 to form a depression. Through the resulting contact pressure, there results an improvement of the conductive heat transfer from the heating zone to the mineral fibers. Furthermore, the depression formation resulting from the

pressure produces a lengthening of the contact time between the heating zone and mineral fibers and thus also an improvement of the heat transfer. For a certain transport speed of the mineral-fiber web, the heat transfer can thus be adapted to the requirements for forming a clean marking without excessive heat application into the mineral-fiber web: of very slow transport speed there is now only a low contact pressure of the roller and thus a reduction of the compression pressure as well as the contact path, so that the desired heat application occurs according to the relatively long contact time available at a low transport speed, while for a high transport speed, the heat /3 transfer is increased in the short time available by increasing the contact pressure and lengthening the contact path correspondingly. Because the marking preferably occurs on the production belt, whose speed is dictated by production requirements, there results one degree of freedom for adapting the marking requirements to the appropriate production speed such that under all occurring production speeds, a sufficient, but not too strong, heat application into the mineral-fiber web is realized. Obviously, the heat application into the mineral-fiber web can also be completely or additionally affected by controlling the temperature of the heating zones. However, under the viewpoint of heat stress on the roller on one hand and of heat stress of the mineral-fiber web at the contact point with the heating zones on the other hand, there is a relatively narrow optimum temperature range to be maintained as much as possible. The different adjustment of the penetration depth of the roller into the surface of the mineral-fiber web enables a corresponding adaptation of the heat application, without which the temperature of the heating zones must leave the optimum operating range.

Particularly for a fixed, predetermined production speed of a defined mineral-fiber web with uniform raw-material density and uniform binding-agent content or also for freely selectable transport speed of the mineral-fiber web, an adaptation of the heat application to

different requirements can be eliminated or can be satisfied in a narrow range just by temperature control. In such a case, it is especially simple in terms of construction for the configuration of the invention if the roller is laid on the mineral-fiber web under its own weight. Means for variable weight support during operation can thus be eliminated if the weight of the roller is adapted to the predetermined transport speed or if the latter is adapted to the weight of the roller. If necessary, the effective weight of the roller can be changed by counterweights to a desired, reduced value.

The means of Claim 4 also enable a considerable simplification of the design of a device required for performing the method in terms of construction, because for the operation a rotary drive can be eliminated and in all cases, in a raised standby position of the roller for its pre-heating, a simpler rotary drive is required to guarantee a uniform heating of the heating zones arranged distributed over the circumference of the roller.

Through the means of Claim 5, broken, so-called dashed marking lines are produced. These typically satisfy their purpose and make it possible to work with individual, shorter heating zones at intervals, which view of their lesser length expansion, prevent problems such as with addition of heat expansion in the longitudinal direction. In addition, the energy consumption is reduced and corresponding negative effects on the material consistency due to tensile or compressive loading of the fibers in the roll are eliminated such that section by section, there is completely unaffected material.

A device that is especially suitable for performing the method according to the invention is described in detail by the characterizing features of Claim 6. Heating rods thus form an especially favorable option in terms of construction for forming the heating zones required according to the method. For forming straight-line dashed markings, straight-line heating rods

can be used; however, other markings such as grids, monograms, or the like can also be generated, if the heating rods are formed according to the desired marking contour.

Through the means of Claim 7, energy losses or heat dissipation or heat conduction from the heating rods is minimized, wherein at the same time, in particular, the lateral border of the heating rods gives a sharp limit to the heating zones and guarantees clean edges of the marking lines through the good heat-absorbing material of the holder.

If the heating rods according to Claim 8 extend a small amount from the circumferential surface of the roller, then the air surrounding the heating rods provides for cooling of the mineral-fiber material bordering the marking strips during the marking and thus favors a clean formation of the edges of the marking lines. Furthermore, this increases the effect of moving the mineral-fiber material along with the roller, particularly for a roller pressed deeper into the mineral-fiber web, because projecting edges of the heating rods favor this effect.

If the heating rods according to Claim 9 can be heated by embedded electrical tubular heating elements, then in terms of construction there is freedom for the configuration of the heating rods. A conventional tubular heating body can be used, which gives low procurement costs and high operability, without limiting the freedom of the outer contour in terms of construction of the heating rods. However, fundamentally any type of suitable heating device, also a noncontact, e.g., inductively operating, heating device can be used, as long as it is guaranteed that the desired heating can be localized in the heating zones.

An especially favorable configuration in terms of construction is given according to Claim 10 through the use of an inner support body for the roller in the form of a cylindrical polygon. In a simpler way, each straight surface of the polygon can be a support for the holder and the installations of a heating rod in terms of construction.

A synchronization of the drive speed of the roller with that of the transport or production belt can be easily by using a direct-current motor to drive the roller. However, if according to Claim 4 a rotating engagement of the roller to the mineral-fiber web is performed, then according to Claim 11 preferably there is an electric motor with a free-wheeling hub configured advantageously as an alternating-current motor, which in the heating phase provides a continuous, slow rotation of the roller at a non-critical rpm for uniform heating of the heating rods, and whose free-wheeling hub takes over from the motor as soon as the roller is laid on the mineral-fiber web and is driven by the latter an increased speed. For each operating interruption, the electric motor then continues to turn the raised roller to guarantee an always uniform heating of the heating rods.

Particularly for selectively strong pressing of the roller into the mineral-fiber web /4
according to Claim 2, the support frame of the roller is held according to Claim 12 in vertical position by means of an adjustment element that can be adjusted by gears for adapting to different transport speeds of the mineral-fiber web. In this way, the contact relationship of the roller to the mineral-fiber web can be fine-adjusted at any time such that an optimum formation of the markings is produced depending on the instantaneous transport speed of the mineral-fiber web.

Advantageously, the adjustment element according to Claim 13 has at least one threaded spindle, which can be driven, e.g., by an electric step motor and guarantees problem-free fine adjustment and maintenance by remote control. The threaded spindles preferably engage a holder frame that can be raised and lowered for the support frame that can also be raised and lowered. According to Claim 14, this holder frame is connected by a pressure medium drive to the support frame and the latter can move between an operating position and a standby position by means of

the compressed-means drive. In this way, a quick, remotely controlled switching of the roller between lowered operating position and raised standby position can be realized, also for emergency stopping, while the fine adjustment of the relative position of the roller to the mineral-fiber web is realized in the operating position by the adjustment element, whose position does not have to be changed during operating pauses or other interruptions.

Further details, features, and advantages of the invention result from the subsequent description of an embodiment with reference to the drawing.

Shown are:

Figure 1, a side view of an end region of a device according to the invention,

Figure 2, an end view, partially cut-away, of a part of the roller of a device according to the invention in its contact on the surface of the mineral-fiber web, and

Figure 3, a schematically simplified, perspective illustration of the roller according to Figure 2.

In Figure 1, a roller is designated with 1, and it is illustrated enlarged with details in Figure 2 and is schematically simplified in perspective in Figure 3. In Figure 1, in this example, only the left end of the roller 1 can be seen, it being understood that there is a corresponding support of the roller on the opposite end. Also in Figure 1, a shaft is designated with 2, which is connected to the roller 1 and is used for its support. The support of the roller 1 is realized by the shaft 2 on a support frame 3 by means of two-sided bearings 4. Outside of the bearing 4, the shaft 2 projects into an electric junction box 5, in which, in a known way, power is supplied to the rotating parts of the roller 1 by means of the schematically illustrated contact ring 6.

The roller 1 can rotate in support 4 by means of the shaft 2. As a rotary drive, an electric motor 7 is provided, which is supported on the support frame 3 and with a drive pinion 8 drives a

drive gear 9 connected to the shaft 2 so that they rotate together by means of a toothed belt or the like. In this way, the roller 1 can be set in rotational motion in the supports 4.

The support frame 3 can be moved up and down on posts 10 of a stationary gantry that is designated overall with 11. In a corresponding way, a holder frame 12 with a traverse 13 can be moved up and down on the posts 10. The support frame 3 is held on the holder frame 12 by means of pressure medium drive 14 in the form of, e.g., pneumatic cylinders 15, which are supported on the traverse 13 and whose piston rod 16 attaches at 17 on the support frame 3. Thus, for a fixed holder frame 12 retraction of the piston rod 16 into the pressure medium cylinder 15 leads to a lifting of the support frame 3 together with roller 1, so that this comes to rest in a lifted standby position, while the illustrated lowered position of the support frame 3 is the operating position, which is shown in more detail in Figure 2.

The holder frame 12 is connected to a traverse 19 of the stationary gantry 11 by means of the adjustment element 18. The adjustment element 18, e.g., in the form of threaded spindles 20, is activated by means of an electric motor 21, e.g., in the form of a step motor and gear 22. The height position of the traverse 13 and the holder frame 12 can be fine-adjusted to a desired position by means of the adjustment element 18. For an extended piston rod 16 of the compressed-means drive 14, there results a corresponding defined height position of the roller 1. By activating the compressed-means drive 14, the roller 1 can be lowered into this predetermined operating position or lifted into a standby position without changing the position of the holder frame 12 and therefore the fine adjustment setting is raised.

In Figure 2, the lower region of roller 1 is illustrated in an end view and partially in section in the operating position. As can be seen, the roller 1 has a carrier body 23 in the form of a polygon, in the example, in the form of a 20-edge polygon, on whose flat outer surfaces 24,

holders 25 for heating rods 26 are held by screws 27. The heating rods 26 have a support body 28 arranged in the interior of the holder 25 and also marking ribs 30 extending out of the circumferential surface designated with 29 of the roller 1. The heating rods 26 consist of a suitable metal with good heat-conduction properties and have in the region of their support body 28 a round receptacle 31, in the example, for receiving typical tubular heating bodies 32, similar to heating coils in immersion heaters. For mounting the tubular heating elements 32, the heating rods 26 are distributed in a plane 33 radial to the axis of the roller 1, wherein the parts 26a and 26b of the heating rod 26 formed in this way are connected by suitable countersunk screws 34 and 35. After the mounting of the tubular heating body 32 in the receptacle 31 of the two open parts 26a and 26b of the heating rod 26, the heating rod 26 is mounted by inserting the screws 34 and 35 and pushed into the holder 25. Then the holder 25 is provided on its outer circumferential outer side with cover plates 36, which engage shoulders 37 of the support body 28 of each heating rod 26 and hold these reliably in the holder 25.

The holders 25 and also the cover plates 36 consist of a suitable material with poor heat-conduction properties, such as a fibrous or fiber-containing pressed composite based on asbestos or asbestos substitute, in order to prevent heat losses of the heating rods 26 and also for protecting the regions of the circumferential surface 29 on both sides of the marking ribs 30 from heating up and taking heat from the mineral-fiber material of the mineral-fiber web designated with 38. In this way, all of the sides of the heating rods 26 inside the circumferential surface 29 of the roller 1 are surrounded by heat-absorbing material. /5

Each heating rod 26 has a receptacle 39 for the reception of a grounding cable. At least one of the heating rods 26 also has a receptacle 40 in the neighborhood of its marking rib 30 for the reception of a thermosensor. The temperature control with reference to the thermosensor and

also the power supply of the tubular heating body 32 is realized by means of the contact ring 6 (cf. Figure 1). However, due to the fine adjustment of the optimum configuration of the markings through different pressure of the roller 1 on the mineral-fiber web 38, temperature control with reference to thermosensors can also be eliminated and instead only the current supply to the tubular heating bodies 32 can be regulated. In stationary operation, a defined temperature is produced, which is suitable for generating the markings, wherein the optimum configuration of markings can be adjusted by the degree of pressing of the roller 1 into the mineral-fiber web 38.

As can be seen from Figure 3, the marking ribs 30 of the heating rods 26 and, if necessary, the heating rods themselves, extend only over a portion of the axial length of the roller 1, so that several marking ribs 30 form a broken line along an outer line of the roller 1 and are arranged at axial intervals. If the length of the heating rods 26 is limited to the axial extent of the marking ribs 30, then there results a plurality of individual, shorter heating rods with easily controlled thermal expansions.

The connection of heating rods 26 to each other can be realized through lines or a correspondingly circumferential damped piece of the tubular heating body 32, which connects the heating rods 26, approximately in arc shape. On the other hand, if the heating rods 26 extend over the entire axial length of the roller 1 and only the holes required for interrupting the marking extend between the sections, designated as marking ribs 30 of the heating rods 26, then there results a very robust and stable construction, for which the tubular heating bodies 32 are embedded over their entire length in the heating rods 26.

The mineral-fiber web 38 is preferably a type like that described in the scope of the German Utility Model Application G 86 10 242.1 forming the basis for the claim of priority. In the example, it is realized by a non-coated mineral-fiber web 38 with a width of 1200 mm, a

nominal thickness of 100 mm, and a length of 6 m. The raw density can be between 10 and 30 kg/m$^3$, particularly between 14 and 25 kg/m [sic; m$^3$], and in the actual example, it is 18 kg/m$^3$. The binding agent can be, in particular, phenolic resin in a percentage of 6-7 wt.% of the dry binding agent in the product, wherein in the example the binding agent content of phenolic resin was 6.6 wt.% (dry). With reference to the properties and the use of such a mineral-fiber web 38, as well as with reference to other details, the entire contents of Utility Model Application G 86 10 242.1 forming the basis for the claim of priority are incorporated by reference.

During operation, the roller 1 with a pulled-in piston rod 16 above the surface designated with 41 of the mineral fiber web 38 is put into rotation by the electric motor 7, with the heating rods 26 being preheated by current supply to the tubular heating bodies 32 to a desired temperature that is monitored by the thermosensor, if necessary. The rotation in the pre-heating phase guarantees uniform heat losses of the individual heating rods 26 and marking ribs 30 and thus their uniform heating without individual temperature control at each individual heating rod 26. At the beginning of production, the piston rods 16 are extended and the roller 1 is lowered to the surface 41 of the mineral-fiber web 38, wherein by means of the electric motor 21 and the adjustment element 18, a fine adjustment of the height position of the roller 1 can be performed over the mineral-fiber web 38. The adjustment is preferably selected so that the marking ribs 30 on the circumference of the roller 1 press into the surface 41 of the mineral-fiber web 38 with the formation of a depression 42. The deeper the depression 42 for a given mineral-fiber web 38, the higher the contact pressure and the effective period for improving the conductive heat transfer from the marking rib 30 to the mineral-fiber material. The surface 41 of the mineral-fiber web 38 is typically uncovered, that is, it is formed by the irregular orientation of the mineral fiber itself;

however, the surface 41 can also be coated, e. g., in the form of fleece based on mineral fiber or other fibers.

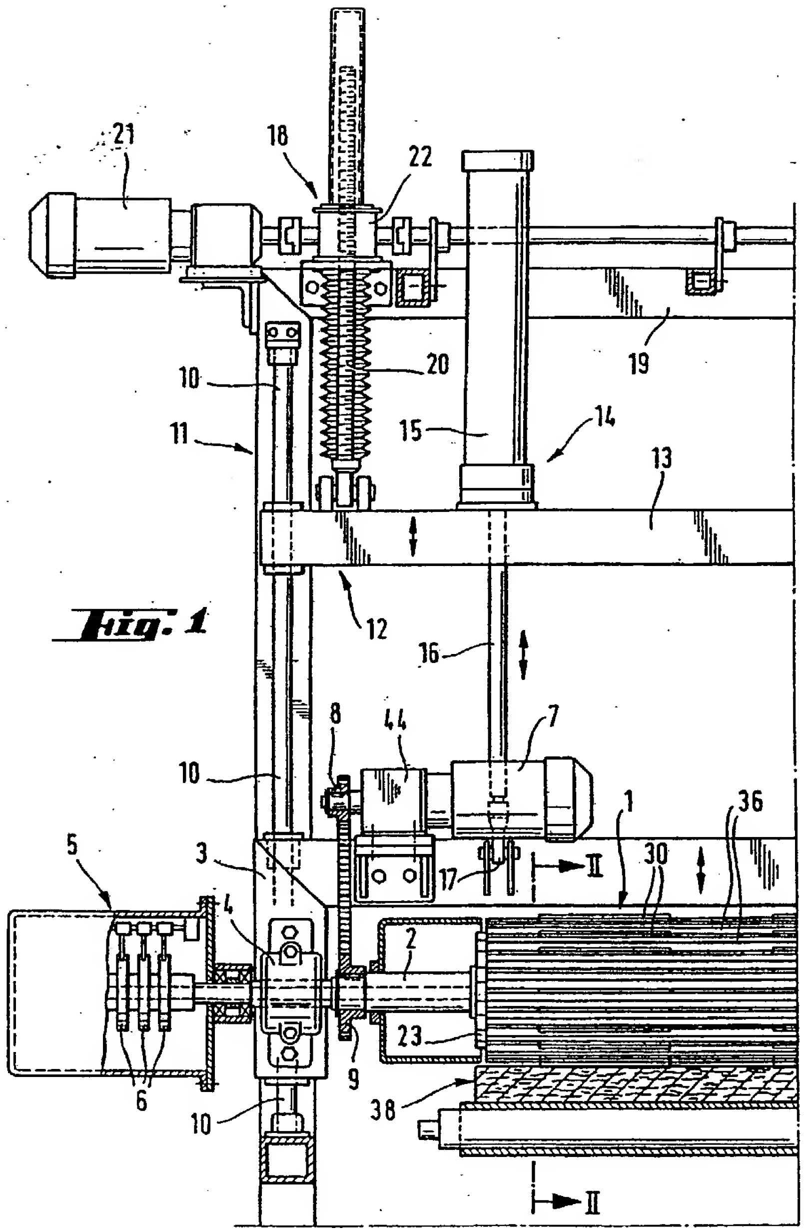
In this way, the marking rib 30 typically has a temperature on the order of magnitude of 400°C and generates a discolored zone indicated by dashed lines 43 of binding-agent decomposition in the mineral-fiber web 38. In this way, marking strips are produced corresponding to the pattern of marking ribs 30 that can be seen in Figure 3 on the surface 41 of the mineral-fiber web 38, which extend perpendicular to the side edges of the mineral-fiber web 41. Through fine adjustment by the adjustment element 18, the heat transfer conditions can be controlled so that a visually clearly set-off marking with sharp edges is produced, without also producing any negative effects on the material of the mineral-fiber web 38 over a flat decomposition zone 43.

By means of the drive pinion 8 and the drive gear 9, a continuous driving of the roller 1 can be performed in sync with the transport speed of the mineral-fiber web 38. Preferably, a direct-current motor is then used as electric motor 7. In the illustrated embodiment, however, an alternating-current motor is used as electric motor 7, which is connected to the drive pinion 8 by means of a free-wheeling hub 44, such that during the driving of the roller 1 by the mineral-fiber web 38 the rotational speed of the roller 1 can overtake that of the electric motor 7. In this case, the drive by the electric motor 7 is used exclusively for maintaining a minimum rotational speed at a non-critical rpm in the lifted standby position when the drive is removed from the mineral-fiber web 38, in order to guarantee a uniform heating of the heating rods 26.

By activating the adjustment element 18, the heat transfer conditions between the marking ribs 30 and the surface 41 of the mineral-fiber web 38 can be adjusted in the mentioned way for forming optimum marking lines. However, for predetermined transport speed and

consistency of the mineral-fiber web 38, such a fine adjustment can also be eliminated, because then there can be a fixed pre-setting of the pressure relationship of the roller 1 on the surface 41 of the mineral-fiber web 38. In this way, the construction for supporting the roller 1 can be /6 considerably simplified. In addition, if the weight of the roller 1 can be maintained so that it alone gives a desired penetration depth through the weight loading of the surface 41 of the mineral-fiber web 38 by the weight of the roller 1, then the compressed-means drive 14 can be switched without pressure in the operating position, so that the roller 1 lies on the mineral-fiber web 38 simply under its own weight. Too strong a penetration can be avoided in this case such that the marking ribs 30 do not project from the undisturbed circumferential surface 29 of the roller 1 by a few millimeters, in the example, approximately 8 mm, but instead lie within the undisturbed circumferential surface 29, so that this helps to contribute to the weight, e.g., in the form of cover plates 36, and thus prevents too strong a local penetration. The illustrated configuration with marking ribs 30 projecting from the circumferential surface 29, however, is suitable, in a particularly excellent way, for driving the roller 1 by the mineral-fiber web 38.

Fig. 1



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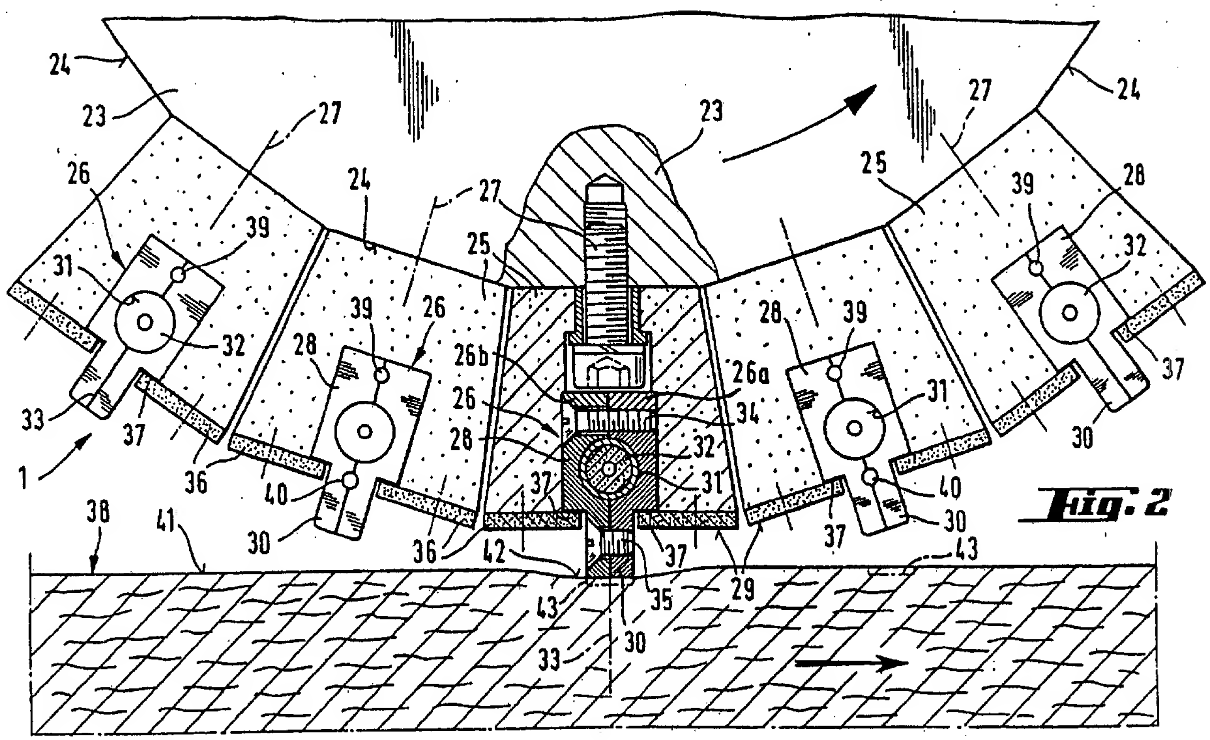


Fig. 2

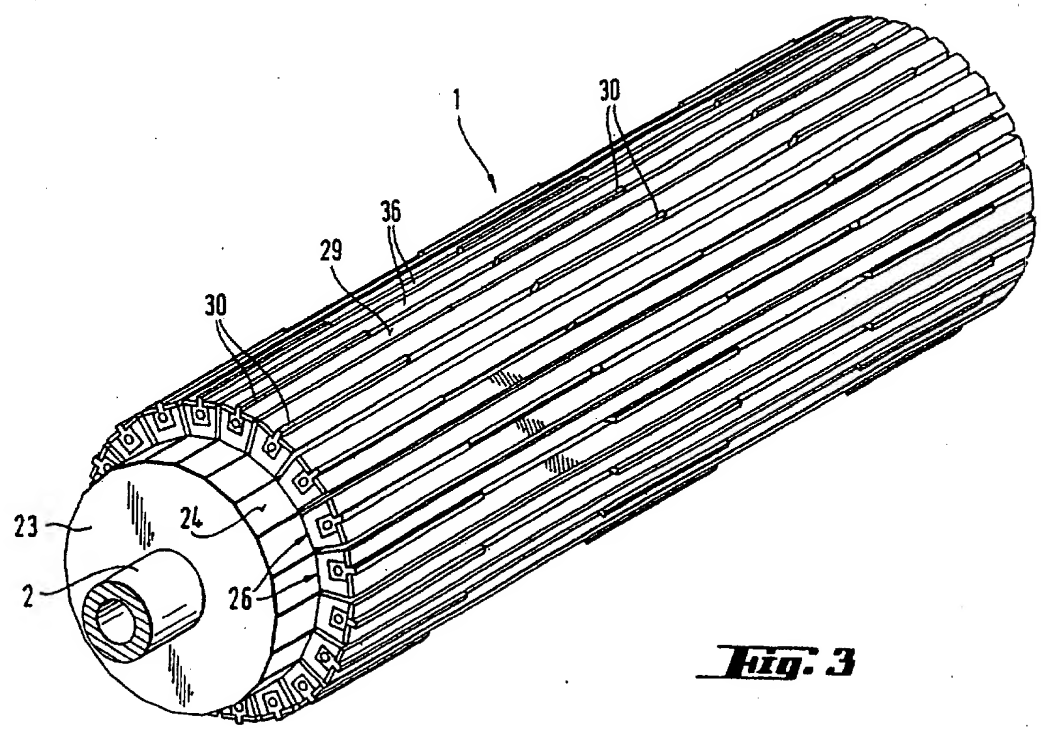


Fig. 3